CLAIM LISTING

A complete listing of the claims reads as follows:

1. (Currently Amended) A pump-less anti-lock brake apparatus for controlling the rotational speeds, during a braking cycle, of only the rear brakes of a vehicle having at least one front and one rear wheel and front and rear brakes acting on the front and rear wheels respectively in response to a front and a rear brake pressure respectively, the apparatus comprising:

a rear anti-lock brake hydraulic circuit including a master cylinder for supplying a volume of pressurized brake fluid to the rear brakes during the braking cycle, a fluid storage element, and a rear brake pressure control (RPC) apparatus for controlling the rear brake circuit as a function of a rear brake pressure and whether the vehicle is operating lightly loaded at a light vehicle weight (LVW) or heavily loaded at a gross vehicle weight (GVW).

2. (Currently Amended) The brake apparatus of claim 1, wherein the RPC apparatus provides rear dynamic proportioning (RDP) when a predetermined deceleration rate is exceeded during the braking event with the vehicle operating at LVW~~; and inhibits RDP when the vehicle is operating at GVW~~.

3. (Currently Amended) A rear pressure control (RPC) apparatus for controlling the rotational speeds, during a braking cycle, of only the rear brakes of a vehicle having at least one front and one rear wheel and front and rear brakes acting on the front and rear wheels respectively in response to a front and a rear brake pressure respectively in a pump-less anti-lock brake apparatus including a rear brake hydraulic circuit having a master cylinder for supplying a volume of pressurized brake fluid to the rear brakes during the braking cycle, a fluid storage element, the RPC apparatus comprising:

a rear brake pressure control (RPC) apparatus for controlling the rear brake hydraulic circuit as a function of a rear brake pressure and whether the vehicle is operating lightly loaded at a light vehicle weight (LVW) or heavily loaded at a gross vehicle weight (GVW).

4. (Original) The RPC apparatus of claim 3, wherein the RPC apparatus provides rear dynamic proportioning (RDP) when a predetermined deceleration rate is exceeded during the braking event with the vehicle operating at LVW; and inhibits RDP when the vehicle is operating at GVW.

5. (Previously Presented) A pump-less anti-lock brake apparatus for controlling the rotational speeds, during a braking cycle, of only the rear brakes of a vehicle having at least one front and one rear wheel and front and rear brakes acting on the front and rear wheels respectively in response to a front and a rear brake pressure respectively, the apparatus comprising:

a rear brake hydraulic circuit including a master cylinder for supplying a volume of pressurized brake fluid to the rear brakes during the braking cycle, a fluid storage element, and a rear brake pressure control (RPC) apparatus for controlling the rear brake hydraulic circuit as a function of the rotational speed of at least one rear wheel and the rear brake pressure.

6. (Previously Presented) The brake apparatus of claim 5 wherein the RPC apparatus further includes:

a rear brake pressure sensor for sensing rear brake pressure at the rear brake and sending a signal to the RPC apparatus; and

a speed sensor operatively connected for sensing a speed of the at least one rear wheel and sending a rear wheel speed signal to the RPC apparatus.

7. (Previously Presented) The brake apparatus of claim 6 wherein the RPC apparatus includes:

a normally open apply valve having an inlet connected to the master cylinder for receiving pressurized fluid therefrom and an outlet connected to the rear brakes; and

a normally closed release valve having an inlet connected to the rear brakes for receiving fluid therefrom and an outlet connected to a fluid receiving element.

8. (Previously Presented) The brake apparatus of claim 7 wherein the rear brake pressure sensor is connected in fluid communication with the outlet of the apply valve and the inlet of the release valve for sensing rear brake pressure in the rear brake hydraulic circuit between the outlet of the apply valve and the inlet of the release valve.

9. (Previously Presented) The brake apparatus of claim 6 wherein the RPC apparatus includes:

a hydraulic control unit (HCU) operatively connecting the master cylinder to the rear brakes and the fluid storage element for controlling fluid pressure applied to the rear brakes during the braking cycle and fluid flow to the fluid storage element; and

an Electronic Control Unit (ECU) operatively connected to the HCU, the rear brake pressure sensor, and the rear wheel speed sensor, for controlling the HCU as a function of the rear brake pressure and the rotational speed of the at least one rear wheel.

10. (Previously Presented) The brake apparatus of claim 5 wherein the RPC apparatus further determines whether the vehicle is operating in a lightly loaded (LVW) condition or heavily loaded (GVW) condition and controls the rear brake hydraulic circuit as a function of whether the vehicle is operating in the LVW or GVW conditions.

11. (Original) The brake apparatus of claim 10 wherein the RPC apparatus determines whether the vehicle is operating in an LVW or GVW condition from a predetermined relationship of rear wheel acceleration to rear brake pressure.

12. (Previously Presented) The brake apparatus of claim 11 wherein the RPC apparatus further controls the rear brakes as a function of a road surface roughness value determined from the rear wheel speed.

13. (Previously Presented) The brake apparatus of claim 6 wherein the RPC apparatus further determines available volume in the fluid storage element from a predetermined relationship of available volume to a rear brake pressure rate.

14. (Previously Presented) A rear pressure control (RPC) apparatus for controlling the rotational speeds, during a braking cycle, of only the rear brakes of a vehicle having at least one front and one rear wheel and front and rear brakes acting on the front and rear wheels respectively in response to a front and a rear brake pressure respectively in a pump-less anti-lock brake apparatus including a rear brake hydraulic circuit having a master cylinder for supplying a volume of pressurized brake fluid to the rear brakes during the braking cycle, a fluid storage element, the RPC apparatus comprising:

an RPC controller for controlling the rear brake hydraulic circuit as a function of the rotational speed of at least one rear wheel and the rear brake pressure.

15. (Original) The brake apparatus of claim 14 wherein the RPC apparatus further includes:

a rear brake pressure sensor for sensing rear brake pressure at the rear brake and sending the signal to the RPC controller; and

a speed sensor operatively connected for sensing a speed of the at least one rear wheel and sending a rear wheel speed signal to the RPC controller.

16. (Previously Presented) The RPC apparatus of claim 15, further including:

a normally open apply valve operatively connected to the RPC controller to be controlled thereby, and having an inlet connected to the master cylinder for receiving pressurized fluid therefrom and an outlet connected to the rear brakes; and

a normally closed release valve operatively connected to the RPC controller to be controlled thereby, and having an inlet connected to the rear brakes for receiving fluid therefrom and an outlet connected to a fluid receiving element.

17. (Previously Presented) The RPC apparatus of claim 16 wherein the rear brake pressure sensor is connected in fluid communication with the outlet of the apply valve and the inlet of the release valve for sensing rear brake pressure in the rear brake hydraulic circuit between the outlet of the apply valve and the inlet of the release valve.

18. (Previously Presented) The RPC apparatus of claim 15, further comprising:

a hydraulic control unit (HCU) operatively connecting the master cylinder to the rear brakes and the fluid storage element for controlling fluid pressure applied to the rear brakes during the braking cycle and fluid flow to the fluid storage element; and

an ECU operatively connected to the HCU, the rear brake pressure sensor, and the rear wheel speed sensor, for controlling the HCU as a function of the rear brake pressure and the rotational speed of the at least one rear wheel.

19. (Previously Presented) The brake apparatus of claim 14 wherein the RPC controller further determines whether the vehicle is operating in a lightly loaded (LVW) condition or heavily loaded (GVW) condition and controls the rear brake hydraulic circuit as a function of whether the vehicle is operating in the LVW or GVW conditions.

20. (Original) The brake apparatus of claim 19 wherein the RPC controller determines whether the vehicle is operating in an LVW or GVW condition from a predetermined relationship of rear wheel acceleration to rear brake pressure.

21. (Original) The brake apparatus of claim 20 wherein the RPC controller further controls the rear brakes as a function a road surface roughness value determined from the rear wheel speed.

22. (Previously Presented) The brake apparatus of claim 15 wherein the RPC controller further determines available volume in the fluid storage element from a predetermined relationship of available volume to a rear brake pressure rate, and terminates control of the rear brake hydraulic circuit by the RPC apparatus when a predetermined value of rear brake pressure rate is sensed by the rear brake pressure sensor.

23. (Currently Amended) A method for controlling a rear brake hydraulic circuit having a fluid storage element and a master cylinder supplying a volume of pressurized brake fluid to the rear brakes during the braking cycle in a pump-less anti-lock brake apparatus controlling the rotational speeds, during a braking cycle, of only the rear brakes of a vehicle having at least one front wheel, at least one rear wheel, and front and rear brakes acting on the front and rear wheels respectively, the method comprising:

determining whether the vehicle is operating lightly loaded at a light vehicle weight (LVW) or heavily loaded at a gross vehicle weight (GVW) as a function of the rotational speed of at least one rear wheel and the rear brake pressue;

providing rear dynamic proportioning (RDP) when a predetermined deceleration rate is exceeded during the braking event with the vehicle operating at LVW; and

inhibiting RDP when the vehicle is operating at GVW.

24. (Previously Presented) The method of claim 23 further comprising:

monitoring rear wheel speed;

monitoring rear brake pressure; and

controlling the rear brake hydraulic circuit as a function of the rear wheel speed and the rear brake pressure.

25. (Cancelled)

26. (Currently Amended) The method of claim [[25]], further comprising:

monitoring rear brake pressure; and

determining a rear brake pressure rate (RBP Rate) from the rear brake pressure.

27. (Previously Presented) The method of claim 23 further comprising:

monitoring rear wheel speed;

determining a vehicle speed (VS Est) as a function of rear wheel speed; and

determining an RDP entry point as a function of the vehicle speed (VS Est).

28. (Original) The method of claim 27 further comprising:

determining a vehicle acceleration (VA Est), and a rear wheel acceleration (RWA Est) from the rear wheel speed;

determining an RDP term as a function of the vehicle acceleration (VA Est) and rear wheel acceleration (RWA Est) for a vehicle operating at LVW.

29. (Original) The method of claim 28 further comprising determining if the RDP term indicates operation of the vehicle at GVW.

30. (Original) The method of claim 29 further comprising:

monitoring rear brake pressure; and

determining if the vehicle is operating at LVW or GVW as a function of rear brake pressure and vehicle acceleration (VA Est).

31. (Original) The method of claim 30 further comprising inhibiting RDP operation of the brake apparatus if the function of rear brake pressure and vehicle acceleration indicate that the vehicle is operating at GVW.

32. (Previously Presented) The method of claim 23 further comprising providing rear pressure control (RPC) of the rear brake hydraulic circuit.

33. (Previously Presented) The method of claim 32 further comprising:
calculating an RPC entry point as a function of vehicle speed (VS Est);
calculating an RPC term as a function of vehicle speed; and
controlling the rear brake hydraulic circuit as a function of the RPC term and RPC entry point.

34. (Previously Presented) The method of claim 33 wherein the RPC term is calculated as the proportional and derivative difference between (VS Est) and the rear wheel speed.

35. (Original) The method of claim 34 further comprising:
determining a road surface condition; and
modifying the RPC entry point as a function of the road surface condition.

36. (Original) The method of claim 35 comprising determining the road surface condition as a function of variations of the rear wheel speed.

37. (Previously Presented) The method of claim 23 further comprising controlling the rear brake hydraulic circuit as a function of a volume available in the fluid storage device for receiving fluid supplied by the master cylinder during the braking cycle.

38. (Previously Presented) The method of claim 37 further comprising:
monitoring rear brake pressure; and
determining a rear brake pressure rate (RBP Rate) from the rear brake pressure.